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Patent

HM-450

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Adolf Zajber, et al.
Serial No:	10/003,032
Filed:	November 15, 2001
For:	DUMMY BAR FOR A CONTINUOUS METAL CASTING PLANT, PARTICULARLY FOR A CONTINUOUS CASTING PLANT FOR PRELIMINARY STEEL SECTIONS
Examiner:	Kuang Y. Lin
Art Unit:	1725

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBMISSION OF BRIEF ON APPEAL

SIR:

Submitted herewith is a Brief On Appeal in triplicate in support of the appeal filed April 9, 2004.

A check in the amount of $ 330.00 to cover the appeal fee pursuant to 37 CFR §1.17 (f) is enclosed.

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Any additional fees or charges required at this time in connection with the application may be charged to Patent and Trademark Office Deposit Account No. 11-1835.

Respectfully submitted,

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Dated: August 26, 2004
Encls: Check ($ 330.00)

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By: _____ Date: August 26, 2004
Friedrich Kueffner

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BRIEF ON APPEAL

S I R:

This Brief is submitted in support of the Appeal filed June 29, 2004 from the Examiner's Final Rejection of claims 1, 3-6 and 8-10 as set forth in the Office Action dated April 9, 2004.

REAL PARTY IN INTEREST

The present application is owned by SMS Demag Aktiengesellschaft by virtue of an assignment recorded January 18, 2002 under reel 012521/frame 0263.

RELATED APPEALS AND INTERFERENCES

There are no presently pending related appeals and interferences.

STATUS OF CLAIMS

Claims 1, 3-6 and 8-10 are the claims in the application and are the claims on appeal.

STATUS OF AMENDMENTS

An Amendment after final rejection in response to the Examiner's final rejection of the claims dated April 9, 2004 was not filed.

SUMMARY OF THE INVENTION

The present invention is directed to a dummy bar for a continuous casting plant for preliminary steel sections having an I-shape or H-shape.

As illustrated in the drawing and described in the second paragraph on page 9 of the specification, the dummy bar comprises a one-piece head piece 3a having dimensions corresponding to the dimensions of a mold cross-section. As mentioned in the paragraph bridging pages 9 and 10 of the specification, two rows 8a, 8b of segments 1 are connected to the head piece 3a, wherein the two rows 8a, 8b extend parallel to each other in a longitudinal direction of the dummy bar and are spaced apart from each other by a width of the dummy bar. As described in the first full paragraph on page 10 of the specification, the individual segments 1 are bevelled so as to recede downwardly at opposite surfaces 15 of the two rows 8a and 8b. As mentioned in the second paragraph on page 9 of the specification, flexible steel bands 2 are mounted on each row of segments 1 for connecting the segments 1. As discussed in the last paragraph on page 4 of the specification, each flexible spring steel band 2a is located on an inner side of a curved portion of the dummy bar and on an outer side of the row of segments 1.

Referring to claim 3, as discussed in the paragraph bridging pages 9 and 10 of the specification, the head piece 3a has at least one recess 10 extending transversely of the longitudinal direction of the dummy bar for connecting the dummy bar to a hot strand.

Referring to claim 4, as discussed in the paragraph bridging pages 9 and 10 of the specification, cross-connecting elements 11 are arranged between the two rows of segments 1 and are spaced apart from each other in the longitudinal direction, wherein each cross-connecting member 11 is attached to two oppositely located segments 1 of the two rows 8a and 8b.

Referring to claim 5, as discussed in the paragraph bridging pages 9 and 10 of the specification, the segments 1 following the head piece 3a in the longitudinal direction are transition segments 12 having a reduced thickness.

Referring to claim 6, as mentioned in the paragraph bridging pages 9 and 10 of the specification, the segments 1 of each row are connected to each other in an articulated pivotable manner by means of a key 13 and slot 14 connection.

Referring to claim 8, as mentioned in the second full paragraph on page 10 of the specification, at least one of the head pieces 3a and the individual segments 1 have inner hollow spaces 16 for weight reduction.

Referring to claim 9, as mentioned in the last paragraph on page 10 of the specification, each spring steel band 2 is screwed or riveted to the row of segments 1.

Referring to claim 10, as discussed in the first paragraph on page 11 of the specification, the two rows 8a and 8b of segments 1 with spring steel strips 2 mounted thereon are spaced apart from each other in accordance with a width of a H-shaped profile of a hot strand.

ISSUES PRESENTED FOR REVIEW

Whether claims 1, 3-6 and 8-10 are unpatentable under 35 U.S.C. §103(a) over J.P. 56-80,364 and further in view of Behrends.

GROUPING OF CLAIMS

Claims 3-6 and 8-10 stand or fall with claim 1.

ARGUMENT

It is respectfully submitted that the Examiner's rejection of claim 1 under 35 U.S.C. §103(a) over JP 56-80,364 and further in view of Behrends is in error because the references do not disclose or suggest the present dummy bar as claimed.

The combination of references does not teach a dummy bar having continuous flexible spring steel bands mounted on each row of segments for connecting the segments, wherein each flexible spring steel band is located on an inner side of a curved portion of the dummy bar and on an outer side of the row of segments, as in the presently claimed invention.

JP '364 does not teach flexible bands and Behrends teaches a plurality of short spine sections 40. Thus, the combination does not teach continuous flexible spring steel bands. The spine of Behrends is complex and has the disadvantages of high assembly cost and assembly time. Additionally, due to the large number of spines and their associated connection components there are a great many sources for failure or other mechanical problems as compared with a construction having continuous bands, as in the present invention. There is no suggestion or teaching by either of the references of continuous flexible spring steel bands as

claimed in the present invention. The Examiner has shown no motivation in either of the references for changing the multi-element spine of Behrends to be continuous flexible spring steel bands as in the presently claimed invention. Furthermore, there is no teaching in the references as to where one skilled in the art would utilize the spines 40 of Behrends in the device of JP '364. To utilize them in the positions of the connection plates would be superfluous in a sectional strand.

Thus, it is respectfully submitted that the combination of references does not teach the presently claimed invention. Furthermore, there is no teaching in either of the references which would lead on skilled in the art to combine these references and arrive at the presently claimed invention. The combination is missing essential features of the claimed invention, most importantly continuous flexible spring steel bands mounted on each row of segments for connecting the segments. Without some indication for the desirability of a continuous band the references cannot make such a band obvious when all they teach is a multi-part member. To read more into the teachings of these references is only possible by impermissible hindsight reconstruction.

It is the Examiner's position that the reference to Behrends discloses such flexible steel bands and that a combination of the references would result in the present invention as claimed.

Applicants respectfully disagree with this position.

The reference to Behrends merely shows a starter bar for a single strand continuous casting plant. Consequently, the reference to Behrends does not disclose or suggest a dummy bar for a continuous casting plant for preliminary steel sections. The use of a single strand would not be possible.

The reference to Behrends does disclose a "flexible spine 40". However, applicants respectfully submit that this flexible spine 40, composed of individual sections, is not comparable to the flexible spring steel bands according to the present invention as claimed in claim 1.

Applicants respectfully submit that the feature of the flexible spring steel bands is not disclosed or suggested by any of the prior art references.

The reference to Behrends does not discuss the special properties of the very short "planar spines 40". These spines are

only "flexible". They are flexible because of their short length, which results in a plurality of "flexible spines 40". Consequently, Behrends is not comparable to claim 1 of the present application, as acknowledged in the office action.

However, the large number of flexible plates which exclusively produce the articulation constitute a disadvantage. The articulation with as little friction as possible is necessary in order to carry out the curvature of the dummy bar, which in parents is pulled through the rollers 28, is effected with as little force application as possible. However, this configuration requires high investment costs and the assembly is time consuming. It is of particular significance that a large number of joints and the slightly curved shape of the flexible elements results in a disadvantageous high friction. The flexibility of the single-strand dummy bar can be increased, however, no forces act against the bending force of the strand, so that the high friction occurs and a high pulling force is required.

A combination of the reference to Behrends with the Japanese reference will not result in the present invention as claimed because the Japanese reference is only directed to a common dummy bar for casting twin blooms.

Claim 1 of the present application does recite two rows of segments connected to the head piece. Two rows are also provided for the twin blooms of the Japanese reference, wherein the two rows extend parallel to each. However, in the Japanese reference the two rows are connected transversely by a plurality of plates 2, as shown in Figs. 1, 2 and 4 of the reference. This produces a large number of joints with all the disadvantages recited above. The plates 2 are rigid. The actual joints are formed by the outwardly located "link-shaped bodies". These bodies can only form a "joint" when an appropriate plate is provided in the longitudinal direction. In other words, the play in the joint in the longitudinal direction results in a continuous elongation of the dummy bar. It could be stated that this play of the joint could be compensated by the features of the reference to Behrends. However, a combination of these two references would result in a very complicated solution composed of a large number of structural components for effecting the bending, straightening and pulling forces which must be applied to the dummy bar when the preliminary steel section is pulled out.

In contrast, the dummy bar according to the present invention is far superior. The two rows of articulated elements of the Japanese reference can only be held together by the large number of flexible spines 40 of Behrends for effecting a

curvature. This means that there is a large number of fastening points, i.e., at least two for each "planar spine 40". This makes the construction very rigid and counteracts the articulation.

The situation in claim 1 of the present application is entirely different. The segments of the rows of segments on each side are held together by a single continuous flexible spring steel band. Accordingly, the articulation is effected by the spring steel band. As set forth in claim 1, the spring steel band is located on the inner side of a curved portion of the dummy bar and on the outer side of the row of segments.

These two spring steel bands reduce the bending work which has to be performed. This results in a guidance without play which is not disclosed by either of the two references relied on by the Examiner.

In view of the foregoing, it is submitted that claim 1 and the claims depending therefrom are allowable over the references relied on by the Examiner and the Board is respectfully requested

to reverse the decision of the Examiner.

Respectfully submitted,

By _____

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Dated: August 26, 2004

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By: _____ Date: August 26, 2004
Friedrich Kueffner

APPENDIX

CLAIMS ON APPEAL

1. A dummy bar for a continuous casting plant for preliminary steel sections having an I-shape or H-shape, the dummy bar comprising

a one-piece head piece having dimensions corresponding to dimensions of a mold cross-section,

two rows of segments connected to the head piece, wherein the two rows extend parallel to each other in a longitudinal direction of the dummy bar and are spaced apart from each other by a width of the dummy bar, the segments being beveled so as to downwardly recede at oppositely located surfaces of the two rows of segments, further comprising

continuous flexible steel bands mounted on each row of segments for connecting the segments, wherein each flexible spring steel band is located on an inner side of a curved portion of the dummy bar and on an outer side of the row of segments.

3. The dummy bar according to claim 1, wherein the head piece has at least one recess extending transversely of the longitudinal direction of the dummy bar for connecting the dummy bar to a hot strand.

4. The dummy bar according to claim 1, further comprising cross-connecting elements arranged between the two rows of segments and spaced apart from each other in the longitudinal direction, wherein each cross-connecting member is attached to two oppositely located segments of the two rows.

5. The dummy bar according to claim 1, wherein the segments following the head piece in the longitudinal direction are transition segments having a reduced thickness.

6. The dummy bar according to claim 1, wherein the segments of each row are connected to each other in an articulated pivotable manner by means of key and slot connections.

8. The dummy bar according to claim 1, wherein at least one of the head pieces and the individual segments have inner hollow spaces for weight reduction.

9. The dummy bar according to claim 1, wherein each spring steel band is screwed or riveted to the row of segments.

10. The dummy bar according to claim 1, wherein the two rows of segments with spring steel strips mounted thereon are spaced apart from each other in accordance with a width of a H-shaped profile of a hot strand.